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ABSTRACT

This study demonstrates the relationship between student values and commitment in the environment of California community college World Wide Web-based instruction. It provides evidence that student motivation can be ascertained in the first week of class and is a strong indicator of "at risk" status and later dropout. A recent model of motivation has suggested that task values have an influence on student choice behaviors. Correlations obtained in this study demonstrate that students who have high task choice values may be expected to persist in a class. Gender, ethnicity, subject, level of prior English classes, or ESL (English as a Second Language), did not influence persistence in the class. It was found that students with low task values, low prior grades in English, and older students (over 28 years) may be more likely to drop out of a class that is completely Web-based, and that this can be reliably measured. (Contains 19 references.) (Author/MES)

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Student Success in Web Based Distance Learning: Measuring Motivation to Identify At Risk Students and Improve Retention in Online Classes

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Abstract: This study demonstrates the relationship between student values and commitment in the environment of California community college web-based instruction. It provides evidence that student motivation can be ascertained in the first week of class and is a strong indicator of "at risk" status and later dropout. A recent model of Motivation, from USC's Human Performance Technology Program, has suggested that task values have an influence on student choice behaviors. Correlations obtained in this study demonstrate that students who have high task choice values may be expected to persist in a class. Gender, ethnicity, subject, level of prior English classes, or ESL did not influence persistence in the class. It was found that students with low task values, low prior grades in English, and older students (over 28 years) may be more likely to drop out of a class that is completely web-based, and that this can be reliably measured.

Introduction

In California Community Colleges, Internet delivered instruction is proliferating with the explosive growth of the world-wide web, the conversion of business to knowledge based economy, increased student numbers and use of the internet, competition and limited resources, according to surveys conducted in 1999 and 2000 by the US National Center for Educational Statistics (NCES) Primary Research Group (PRG) and (NCES, 1999; PRG, 2000).

Community colleges enroll 10.4 million students annually, and award over 600,000 AA degrees and certificates (California Chancellor's Office, 1999). Students enrolled in Community Colleges represent 44% of all undergraduates in the United States (NCES, 1999). In California by 1998, the number of students involved in distance learning classes that used Internet delivery tripled from a year before. By the 2000 - 2001 academic year, estimates of the number of students enrolled in web-based distance learning classes at California community colleges were set at 40,000. (CVC, 2001).

Adult education and training are multi-billion dollar industries, and new industries are being created to offer training at a distance. (Ko & Rosen, 2001; Kearsley & Marquardt, 1999) Web-based distance education provides an opportunity to save costs in travel, housing, building new schools, and instructor salaries, while offering the potential for self-paced, anytime, anywhere dispensing of learning.

There is an expectation that computers are superior cognitive tools and that employing them will improve instruction (Moore, 1990; Clark & Verduin, 1991; Jonassen, 1996; Sugrue 1998). But performance has not met the expectations of this medium (Bork, 1997). This may be because there is a considerable gap in the understanding of many educators about the basic elements necessary to support learning, and the role computers play (Clark, 1993).

At Foothill Community College, a 1997 survey showed a 20% attrition rate for regular classes and a 50% attrition rate for classes offered at a distance (Mendrinos, 2000). These results are consistent with some findings for distance learning classes at other institutions (NCES, 1999; Primary Research, 2000). Student engagement, motivation and environment are the areas where students have the most problems in this type of course delivery (Moore, 1990; Kember, 1990; Iverson, 1995). The success of web-based distance education will depend on many factors, but it must meet the specific motivational requirements of learners to be viable.

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If a majority of students are to be served in online instruction, the high rate of attrition in distance learning classes will need to be addressed. A first step towards solving this problem is assessing what profile of student can be expected to succeed or fail in web-based instruction. Once this is known, the information can be used to predict outcomes and provide solutions.

The Study

The purpose of the study is to examine student motivation and drop out behavior. The ostensible reason for looking at this question is to find measures that may, at the onset of a class, suggest which students might be at risk of dropping or failing the class. If the degree of motivation a student holds for the class may put them at risk for non-completion or failure, appropriate intervention strategies may be designed to assist the student in a timely way and with a greater likelihood of success. Social cognitive models of motivation propose that self-beliefs and self-regulatory processes are important in explaining how an individual accomplishes a task in a specific context. Learning, motivation and environment all play prominent roles in an individual's perceptions of a learning task (Pintrich & DeGroot, 1990; Clark, 1997). Drawing on the USC Cohort CANE Model of Motivation (1997), this study will serve to establish the relationship between the variables of task value and task choice in classes that are wholly provided by web-based distance learning. It will examine the level of task values students hold for classes and compare their performance with this measure. The study will also consider if demographics have a relationship to students' decision to stay in a class, in order to determine if there is a particular population of learners who is "at risk" in this learning environment.

Although some studies have looked at the effects of task values on choice behaviors there appear to be no known studies that look at the ability of task values to predict task choice in web-based classes. Moreover, early studies of commitment (task choice) and achievement, have viewed task values as a moderating influence effecting effort and indirectly effecting achievement (Eccles, 1983; Greene, 1999). Very few studies have considered that task values may have a direct influence on task choice or achievement. This may be because earlier theory and studies assumed task values were not separate variables (Eccles, 1995). A number of researchers have recommended investigation of the predictive possibilities of task values for various behaviors (Eccles & Wigfield, 1995; Greene, 1999; Lin, 1999).

Several recent studies have examined task values influence on commitment and goal orientation. Some of these studies indicate that task values may directly influence task choice, commitment and achievement (Lewis 1997, Lin 1999, Greene 1999). Task values may be a "missing ingredient" that is not being measured or considered in studies of student motivation, beliefs, commitment, and achievement. They may explain confounding results obtained in other studies of variables know to influence performance such as effort and self-efficacy.

PERSONAL AGENCY Efficacy Context	X	EMOTION Mood	X	VALUES Utility Interest Importance	=	COMMITMENT (Task Choice)

Figure 1. CANE (Commitment And Necessary Effort) Model of Task Commitment. Clark (1997)

This study is a survey that examines students' Interest, Importance and Utility in two different social science classes: political science and general psychology. Four 7-response likert scale questions were developed for each of the subscales, Importance, Interest and Utility. Additional dichotomous and categorical questions were developed for personal variables in order to consider the effects of demographic variables on the subjects' responses. These personal variables included student experience in prior online learning classes, prior grades and courses in English, ESL, age, gender, and ethnic identity.

The survey was directly e-mailed to students in the two classes. Out of 150 possible subjects, 59 responded representing a sample size of 39%. Subjects' responses to the survey were collected the first week of class. Subsequently, data was collected again at the fifth week of class to determine student retention. This information was obtained from the college admissions records, verifying continued student enrollment beyond the school drop date.

The survey looks at three specific aspects of Task Values: Interest, Importance and Utility. There are four questions for each of these constructs to comprise each sub-scale of Task Value. A 7-point Likert scoring scale was used with

the choices given ranging from "not at all" to "very much" After the 12 questions about task value, there were 8 additional questions about demographics, online experience and English skills. These questions allowed the respondents to choose dichotomous or categorical answers. For example, "Is this your first online class" (Yes)___ (No)___. Another example of a question, "I obtained a grade of ____in my highest level English class, (indicate A, B, C, D, or F)".

Personal variables were analyzed in terms of frequencies, to support the assertion that the sample's study results can be generalized to the total population of adult learners. The reliability of the measures of interest importance and utility were calculated. An item analysis statistics was done for the three components of task value; interest, importance, and utility (Eccles, 1995). These measures were correlated with the student's enrollment in the class at the fifth week (following the decision point for dropping the class). Next correlations were made for all variables. Finally, a factor analysis was made to determine the integrity of the variables for the three components of task value (importance, interest and utility).

Results

The survey data were collected and evaluated to determine if there is a relationship between Task Values and Task Choice. Out of a population of 150 students 59 responded to a self-report survey, which represents a sample of 39% of the total population. Considering the means of the demographics of this study, for the 59 survey participants, the results indicate that the majority of students were not taking their first online class, were not ESL, had college level English with a B or better, were female, white and did not drop the class. They also showed high levels of interest importance and utility.

There was three task value scales: importance (IMP), interest (INT), and utility (UT). There were four items for each scale in task value, to comprising 12 items to constitute the construct task value construct, as defined by Eccles and Wigfield (1995).

A test of the internal consistency reliability (Cronbach's α) for the task value scales was conducted. The results of the test for reliability are shown below. Task value scales obtained alpha coefficients (α from .81 to .86). The customary criteria for reliability is an α value of .70 or higher. These results suggest that the measures of task value: interest (α .8124), importance (α .8490), and utility (α .8686) are highly reliable measures. The measures, which were adopted from Eccles and Wigfield's 1995 study, are shown to be reliable measures in the population of adult learners in a web-based class. These results are consistent with other research (Green 1999, Lin 1999, Blair O'Neil & Price, 1999).

Cronbach α for the Task Value Scales

Task Value	α
Interest	.8124
Importance	.8490
Utility	.8686

Figure 2. Reliability of the Task Value Scales (Cronbach Alpha)

Correlational Analysis of all Variables

A correlation analysis shows that there is a positive correlation between the constructs of Task Value and Task Choice. The results indicate a positive correlation between subjects who remained in the class past week 5 (choosers) and the construct of Task Value. Similarly, there is a lower correlation between subjects who do not remain in the class (non-choosers) and Task Value. Correlations between students with high Importance Interest and Utility and students who chose to dropout were significant at the .05 level (2-tailed). This means that students who dropped the class by week five had demonstrated low task value in at week one. Conversely, students who demonstrated high task values in the first week remained in the class at week five. This is a significant finding and clearly demonstrates a relationship between task value and task choice. These results suggest that high task values are related to task choice and the differences between the two groups are statistically significant.

Correlations

		First On-line Class	English Class	English Grade	English as Second Language	Gender of Participant	Ethnic Backgroun d of Participant	Age of Participant	Drop Class	Class of Participant	UTILITY	INTEREST	IMPORT
First On-line Clas:	Pearson Correlati	1.000	.044	-.185	-.006	.048	.077	.053	.015	-.079	-.189	-.116	-.103
	Sig. (2-tailed)		.740	.161	.966	.721	.561	.688	.911	.550	.151	.381	.437
	N	59	59	59	59	59	59	59	59	59	59	59	59
English Class	Pearson Correlati	.044	1.000	.171	-.104	-.091	.052	.114	.119	-.335*	-.295*	-.156	-.135
	Sig. (2-tailed)	.740		.196	.434	.495	.697	.391	.367	.010	.023	.239	.308
	N	59	59	59	59	59	59	59	59	59	59	59	59
English Grade	Pearson Correlati	-.185	.171	1.000	-.170	-.098	-.074	-.062	-.288*	-.154	-.032	-.203	-.292*
	Sig. (2-tailed)	.161	.196		.199	.459	.575	.642	.027	.245	.811	.124	.025
	N	59	59	59	59	59	59	59	59	59	59	59	59
English as Second Language	Pearson Correlati	-.006	-.104	-.170	1.000	.002	.201	-.069	.138	-.081	-.119	-.071	.115
	Sig. (2-tailed)	.966	.434	.199		.988	.127	.603	.299	.543	.371	.595	.387
	N	59	59	59	59	59	59	59	59	59	59	59	59
Gender of Particip	Pearson Correlati	.048	-.091	-.098	.002	1.000	.145	-.004	-.204	-.050	-.072	-.016	-.018
	Sig. (2-tailed)	.721	.495	.459	.988		.272	.974	.121	.706	.589	.906	.890
	N	59	59	59	59	59	59	59	59	59	59	59	59
Ethnic Background Participant	Pearson Correlati	.077	.052	-.074	.201	.145	1.000	-.040	.030	-.069	-.201	-.141	-.179
	Sig. (2-tailed)	.561	.697	.575	.127	.272		.766	.820	.604	.127	.287	.176
	N	59	59	59	59	59	59	59	59	59	59	59	59
Age of Participant	Pearson Correlati	.053	.114	-.062	-.069	-.004	-.040	1.000	.292*	.007	.159	.202	.265*
	Sig. (2-tailed)	.688	.391	.642	.603	.974	.766		.025	.959	.229	.124	.043
	N	59	59	59	59	59	59	59	59	59	59	59	59
Drop Class	Pearson Correlati	.015	.119	-.288*	.138	-.204	.030	.292*	1.000	-.022	.352**	.437**	.285*
	Sig. (2-tailed)	.911	.367	.027	.299	.121	.820	.025		.867	.006	.001	.029
	N	59	59	59	59	59	59	59	59	59	59	59	59
Class of Participar	Pearson Correlati	-.079	-.335*	-.154	-.081	-.050	-.069	.007	-.022	1.000	.205	.362**	.058
	Sig. (2-tailed)	.550	.010	.245	.543	.706	.604	.959	.867		.119	.005	.660
	N	59	59	59	59	59	59	59	59	59	59	59	59
UTILITY	Pearson Correlati	-.189	-.295*	-.032	-.119	-.072	-.201	.159	.352**	.205	1.000	.683**	.697**
	Sig. (2-tailed)	.151	.023	.811	.371	.589	.127	.229	.006	.119		.000	.000
	N	59	59	59	59	59	59	59	59	59	59	59	59
INTEREST	Pearson Correlati	-.116	-.156	-.203	-.071	-.016	-.141	.202	.437**	.362**	.683**	1.000	.610**
	Sig. (2-tailed)	.381	.239	.124	.595	.906	.287	.124	.001	.005	.000		.000
	N	59	59	59	59	59	59	59	59	59	59	59	59
IMPORT	Pearson Correlati	-.103	-.135	-.292*	.115	-.018	-.179	.265*	.285*	.058	.697**	.610**	1.000
	Sig. (2-tailed)	.437	.308	.025	.387	.890	.176	.043	.029	.660	.000	.000	
	N	59	59	59	59	59	59	59	59	59	59	59	59

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 1. Correlation of All Variables including Task Value and Demographics

Rotated and component factor analysis were also conducted to confirm the item groupings of the scales and evaluate the variables. These analysis attempt to provide evidence of the independence of the variables. Essentially, the degree of differentiation among the items for each Task Value variable of the Task Value construct is examined. Most of the items are identified as coherent, and supporting the construct, but not independent. It may be significant that Eccles (1985) in some of her work used the three separate components as undifferentiated within the Task Value construct (Greene, DeBacker et al. 1999).

Implications

The results of the study demonstrate that Task Values are strongly correlated with Task Choice. Importance Interest and Utility, three components of Task Value, appear to be positively related to a student's decision to stay enrolled in a class. Consequently students who have high task choice values can be expected to persist in a class. This was shown in the strong relationship between these values and student behavior. In addition, the study showed that the demographics did not appear to be significant in differentiating student behavior, except for the findings that the older students and students with low prior English grades were not as likely to choose to stay in the class. Persistence in the class was not influenced by gender, ethnicity, subject (political science or psychology), or level of prior English classes or English as a second language. Therefore students with low task values, low prior grades in English, and older students may be more likely to drop out of a completely web-based class.

The findings of the study suggest that Task Value is an Indicator of Choice. This is consistent with earlier studies that looked at task values and behavior in other populations and environments. (Eccles, 1995; Greene, DeBacker, et al, 1999; Lin, 1999). In fact, the prediction made by Eccles and Wigfield (1995) that Utility would increase over Interest in studies with an older population of students, was found. Comparing the coefficients obtained by Eccles and Wigfield in their studies of adolescent math students with the results obtained for this population of adults, the values in this study were stronger. This was predicted by Eccles and Wigfield, 1995 and later By Greene, DeBacker, et al, 1999). Based on findings by Harter (1981), indicating academic achievement becomes more

extrinsic with age, Eccles and Wigfield (1995) suggested that utility value would increase with age over interest value. In this study students from ages 18 – 52 found utility value stronger than interest value, although both were high.

The findings of the study suggest that most of the demographics measured are not indicative of student task values or task choice in the class, with two exceptions. The two demographic variables that were significant were prior grade in English and the age of the student. The variables of first online class, college English, high school English, English as a second language, gender, and ethnic background were not indicative of a student's task values or task choice. In other words, they did not indicate whether a student would drop or stay in the class. But there were significant correlations for English grade of -.288 and age of participant .292 were significant at the .05 level (2-tailed). This meant that students who'd done well in English classes were more likely to stay in the class and that the older students were more likely to drop the class.

There is also some evidence that dropping the class is negatively correlated with the grade achieved in English. This is a result that might be expected, where a student who has stronger English skills would find the text-based demands of a web-based distance learning class to make success in this academic environment easier. The finding that a high grade in a prior English class would indicate a student's choice to remain in a class seems to be a logical outcome in light of the nature of internet delivered web-based classes. They are highly text oriented. The majority of the difficulty in an online class is the demand for effective writing skills. Although reading and critical thinking are also required, the student is evaluated on how well they can express what they have learned in writing. They do not have the opportunity to verbally join class discussions. This high reliance on English skills may cause students whose English skills are weak to opt out of the class. Interestingly English level and ESL were not significant. So it suggests that students who do well in English prefer this type of class, regardless of what prior coursework they may have had in English, and in this regard may be self-screening.

There is also a result that dropping the class is correlated with age. It is not clear why older students, in this case those in the 28 – 50 range would be more likely to drop the class. Considering the large majority of students were women, it may be considered that work and family demands are more likely to interfere with this group of students. These were the reasons given most often as interfering with success of adult learners in other studies (Kember, 1990). From the limited sample size it would be hard to draw conclusions on these matters, but it suggests a need for further exploration. Questions about work and family demands might confirm these results.

These findings may represent anomalies because of sample size, but may also be measures of other motivational factors. Kember (1990) mentioned the same finding in his research involving adult distance learners. It may be that older, in this case students between the mean age of 30 and the oldest at 52, may have had more interruptions from work and family. Some other studies distance education studies did not find a significant effect of age. The relationship of age to drop out appears to be a finding that may be related to the size or composition of the sample, or confounded by other factors such as the marital status, number of children or work demands. Considering the students sampled live in silicon valley in the midst of a very pressured fast economy, it is not surprising that older students may have less expendable time and incorrectly assumed that the flexibility of online classes would allow them to take classes they otherwise would not be able to fit into their schedules.

Of particular importance to attempts to predict student performance is the finding that English levels, experience in online classes, ethnicity, and English as a second language, did not predict student choice. Task values were much stronger indicators of choice behavior. Also of significance is the finding that prior low grades in English may be important in indicating a student's decision to drop out of a web-based class.

In brief, students who have high task choice values can be expected to persist in a class. This was shown in the strong relationship between these values and student choice behavior. In addition, the study showed that most demographics measured did not appear to be significant in differentiating student behavior, with the exception of older students and those with poor prior grades in English being more likely to drop out. Gender, ethnicity, type of social science class, or level of English ability did not influence persistence in the class. These findings are also important in correctly identifying at risk students and in streamlining a possible instrument for this purpose

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